MULTI-PINTLE HINGE

BACKGROUND OF THE INVENTION

Windows of the tiltable type, in particular of the kind adapted to be installed in sloping roofs, must satisfy heavy demands with respect to weathertightness and in general they therefore comprise an inner rabbet or abutment fillet aiming particularly at eliminating draft, and an external metallic or plastic covering primarily intended to prevent rainwater from penetrating between the stationary frame and the sash of the window. The rabbet fillet as well as the outer covering are necessarily divided at the pivot axis, i.e. in the areas of the hinge devices, the portions of the fillet and covering above the axis being secured to the frame, while the portions below the axis are mounted on the sash so as to follow the movements thereof. A condition of an optimum tightness is that the rabbet fillet forms a tight closure below the hinges, thereby restricting the permissible depth of the hinges, i.e. their dimension perpendicular to the plane of the window, but it is even more important that the hinges guide the sash so as to allow a sufficient overlapping, in the closed position of the window, between the movable and non-movable parts of the outer covering without causing these parts to prevent a tilting of the window sash through approximately 180°, or without causing the parts to be damaged by such a movement of the sash.

The sash should moreover be balanced in such a manner that, at least within certain open positions, it remains immovable in any angular position in relation to the stationary frame, and it should further be easily mounted in and dismounted from the frame, for instance with respect to changing its pane.

These requirements are considered to be fulfilled by a hinged device of the kind illustrated in FIGS. 6 and 7 of British patent specification No. 1,028,251 which discloses a tilting window hinge device comprising frame and sash portions having a curved guide and a correspondingly shaped sliding rail, respectively, which together define a tilting axis located at a slight distance outside the outer surface of the window. The sliding rail member of the sash portion is connected to the base plate of the same portion through a pivot pin allowing a further tilting of the sash after the termination of the displacement of the sliding rail member along the curved guide of the hinge portion of the frame.

In a hinge structure of this design it is difficult to control the frictional properties of the sliding rail and guide members and, consequently, to control the balancing conditions of the window sash without preventing a conveniently easy opening and closing movement of the sash. A further fact is that the prior art hinge in practice must include a large number of components which may well be produced relatively cheaply, but still they require rather expensive stamping tools and many assembling operations.

SUMMARY OF THE INVENTION

The invention relates to a hinge device which is of the same general type as the one referred to above but which solves the problems caused by the varying friction to which the displaceable sliding rail of the known hinge is subjected. A particular feature of the hinge device of the present invention resides in a bearing member which, through a pivot pin, is connected to the base plate of one of the hinge portions and is displaceable in a substantially translatory way relative to the base plate of the other hinge portion.

In this case the bearing member may be a simple blank stamped out from a metal sheet, and also its connection to the base plate of the hinge portion concerned may be obtained in a structurally simple manner, e.g. by means of a pair of links or straps, as more fully explained in the following. It is hereby made possible, within the confined space available for the hinge, to choose the movement of the guide member according to desire. This implies that, contrary to what is the case of the above mentioned prior construction, the pivot pin need not necessarily follow a circular arc between its two extreme positions. As a result, a substantial independence is obtained as to determining the movement of the window frame in the vicinity of its closed position, whereby the tightness between the stationary and movable parts of the outer covering may be improved inasmuch as their area of overlapping may be enlarged and/or their spacing in this area may be reduced. Moreover, in its outer extreme position, the pivot pin may be displaced as far away from the plane of the window as to allow a tilting of the sash through approximately 180° without causing the covering parts to get jammed.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other details of the hinge device according to the invention will be more fully explained in the following detailed description with reference to the drawing, in which

FIG. 1 is a schematical view of the hinge according to the present invention, in connection with a relatively steep overhead window shown in its closed position, the outer covering being shown purely diagrammatically,

FIG. 2 shows the same hinge subsequent to the maximum displacement of its bearing member carrying the pivot pin, and

FIG. 3 is an illustration of an alternate embodiment of a complete hinge device according to the present invention intended for a tilting window having a smaller inclination than assumed in FIGS. 1 and 2.

DETAILED DESCRIPTION

FIG. 1 shows only the frame portion of the hinge device which comprises a base plate 1 provided with screw holes 2. This hinge portion is supposed to be mounted in a stationary frame, not shown, so that its front edge is substantially flush with the outer surface of the frame to which a plate covering 3 is secured, which extends from the top downwards to the hinge area where it overlaps a corresponding covering 4 on the movable sash, not shown. By the initial opening movement of the sash the top end of the sash covering 4 will substantially follow the arrow so as to get clear of the frame covering 3. This movement may be regarded as a displacement downwards and outwards in relation to the frame, combined with a controlled pivoting or tilting of the sash, although FIGS. 1 and 2 only show the mechanism serving to guide the displacement. In the shown embodiment, the said mechanism incorporates only three elements, viz. a bearing member 5 in the form of an angular blank stamped out from sheet metal, and two more or less parallel links or straps 6 and 7, which at one end are connected with the base plate 1 adjacent its front edge through hinge pins 8 and 9 and at their other end are rotatably connected through pins 10 and